Motorola 52nd Street Superfund Site
Community Advisory Group (CAG) Meeting

Thursday, March 13, 2003
6:00 p.m. to 8:00 p.m.
Burton Barr Central Library
1221 North Central Avenue, 4th Floor Lecture Room
Phoenix

MINUTES

Members in attendance:
Hildellred Chambers Add
Rey Covarrubias

ADEQ Staff in attendance:
Kris Kommalan, ADEQ Project Manager
John Kivett, ADEQ Hydrologist
Tina Wesoloskie, ADEQ Community Involvement Coordinator
Alex Zavala, ADEQ Community Involvement Coordinator

EPA Staff in attendance:
Nadia Hollan, EPA Project Manager
Viola Cooper, EPA Community Involvement Coordinator

Others in attendance:
Michael Long
Brian Waggle
Tom Suriano
Tom Mooney
Jim Hartley
James Felix
Bob Frank
Adam Ng
Wayne Schiemann
Steve Whillier
Stan Jolliffe
Anna Jolliffe

PIOU #03-293

1. *Welcome and Introductions* - Tina Wesoloskie, ADEQ Community Involvement Coordinator
Ms. Wesoloskie opened the meeting. All ADEQ and EPA staff, CAG members, and audience members introduced themselves. Ms. Wesoloskie reminded CAG and audience members to sign in and collect handout materials. Ms. Wesoloskie briefly reviewed the agenda topics.

2. *Review of Terms and Concepts* - John Kivett, ADEQ Hydrologist
Mr. Kivett explained that the purpose of reviewing the terms and concepts was to provide a brief review to CAG members and any new attending audience members. Mr. Kivett also commented that a CAG member recommended reviewing terms and concepts at the previous meeting.

The main contaminants at the site are trichloroethene (TCE) and trichloroethane (TCA) which are chlorinated solvents. There are also several "daughter" or breakdown products including dichloroethene (DCE) and vinyl chloride. Soil contamination may occur when chemicals are (1) in the tiny spaces between grains of soil (called pore spaces), (2) attached to the grains of soil, (3) dissolved in water found in the pore spaces, and (4) as vapor within the pore spaces. Groundwater contamination may occur when chemicals dissolve into groundwater (the water found beneath the Earth's surface that fills the pore spaces). Soil contamination is measured by labs with specified analytical procedures. The labs determine the amount of chemical, typically in milligrams (mg), in a given amount of soil, typically in kilograms (kg), resulting in mg/kg. This may also be expressed as parts per million (ppm). Groundwater contamination is also measured in labs with specified analytical procedures. The labs determine the amount of chemical, typically in micrograms (Fg), in a given amount of water, typically measured in liters (l), resulting in Fg/l. This may also be expressed as parts per billion (ppb). Mr. Kivett provided a table of real-life comparisons to ppm and ppb. For example, as measured by time, ppm is compared to one inch in 16 miles; ppb is compared to one inch in 16,000 miles.

There are two sets of cleanup standards that are required by state law. The Soil Remediation Standards Rule (Arizona Administrative Code (A.A.C.) R18-7-201 *et seq.*) establishes soil remediation levels (SRLs) for certain chemicals by which soils in Arizona must be cleaned up. Soils can be remediated to residential or non-residential standards. If soils are remediated to non-residential standards, a deed restriction must be placed on

the property. The water quality rules are called the Numeric Aquifer Water Quality Standards (AWQS) (A.A.C. R18-11-401 *et seq.*) This rule establishes the aquifer water quality standards for certain chemicals, which are groundwater levels by which groundwater in Arizona is protected for drinking water use. EPA also has federal cleanup standards. For federal Superfund sites, the more conservative standard (or the lower level) is used.

Mr. Kivett reviewed several common treatment technologies. Soil vapor extraction (SVE) is a commonly used technique for cleaning up soils contaminated with solvents. SVE systems are comprised of soil vapor extraction wells, underground and above ground piping, and powerful electric motors which run air pumps. The air pumps pull vapors through the pipelines, through the wells, and from the contaminated soils. The contaminated vapors are treated before they are discharged into the air. Pump and treat refers to a treatment technology that involves installing groundwater extraction wells and treating the water aboveground to remove the contaminants. The treated water may be reinjected into the aquifer or used for water supply and/or irrigation. Air stripping is a treatment system that removes volatile organic compounds (VOCs) from contaminated groundwater as air is forced through the water, causing the compounds to evaporate. The vaporized compounds are treated before they are discharged into the air. Granular activated carbon (GAC) treatment removes contaminants from groundwater (or from vapors) by filtering through carbon.

3. *OU2 Progress Update* - Nadia Hollan, EPA Project Manager
Ms. Hollan provided an update on the OU2 treatment system. To date, over two billion gallons of groundwater have been treated with an average of 3.9 million gallons a day. To date, approximately 3,670 pounds of VOCs have been removed. Carbon in each of the 18 carbon units was changed out in 2002. The first set of nine pairs was changed out in April/May and the second set was changed out in September/October 2002. The OU2 groundwater treatment system effectiveness report is due to EPA on April 11th. This report will document how efficient the system has been at capturing the contaminants in the first year. This is an interim remedy designed to contain and reduce the levels of contamination. The report will also provide recommendations on how to improve the system's efficiency.

EPA is currently reviewing a proposal by Motorola and Honeywell to install eight new monitoring wells in the OU2 area to confirm the capture of the OU2 treatment system. The four monitoring well locations are: near the intersection of Patricio and Polk Streets; near the intersection of 19th and Van Buren Streets; near the intersection of 19th and Adams Streets; and south of the intersection of 18th and Jefferson Streets. EPA anticipated drilling to being in mid-April to mid-May.

4. *OU3 Phase II Well Drilling Update* - Nadia Hollan, EPA Project Manager
EPA is completing several wells in the OU3 study area. Ms. Hollan showed a drilling schedule that was included in the handout materials. EPA is expecting to be completed with well installation in June 2003.

5. *Honeywell Bioventing Pilot Study and Well Drilling Update* - Kris Kommalan, ADEQ Project Manager
Honeywell Well Drilling Update - Kris Kommalan
Honeywell, with ADEQ oversight, is installing 31 groundwater monitoring wells. These wells will help define the extent of contamination emanating from the Honeywell 34th Street facility. Ms. Kommalan showed a map depicting the locations of the proposed new monitoring wells, existing Motorola and Honeywell wells, and other wells (City of Phoenix, etc.). Ms. Kommalan described that each well is designated with a number and either A, B, or C. The A wells are wells that will be installed in the upper part of the aquifer called the Salt River gravel. The B wells are wells that will be installed in the middle part of the aquifer called the basin fill. The C wells will be installed in the lower part of the aquifer called the bedrock. Ms. Kommalan provided a tentative drilling schedule. Honeywell will begin to install the wells located on their property first. Some wells will be drilled on the airport property which will require shutting down the north runway. Ms. Kommalan also provided a table describing the exact well locations. There may be additional wells installed in the future that are not indicated on the map provided at this meeting. Ms. Wesoloskie explained that ADEQ will provide well drilling notices to any neighborhoods impacted by the drilling prior to drilling commencement. Ms. Wesoloskie provided an example of the well drilling notice that will be distributed to the

community members. One CAG member complimented the well drilling notices and commented that several of his nearby community members have given him positive feedback on the notices.

One CAG member asked if at the Honeywell facility there was contamination along the west side of the buildings, and if so, are they fined for this contamination? Ms. Kommalan replied that Honeywell is not fined for this. Since the releases occurred prior to any environmental laws, they are not fined for past releases. However, Honeywell and the agencies are working to investigate the source areas and to cleanup the contamination.

Bioventing Pilot Study - Kris Kommalan, ADEQ Project Manager
Ms. Kommalan explained that Honeywell conducted a bioventing pilot study on a voluntary basis. ADEQ did not require this work. Honeywell collected this information to determine the best method to remove the free product that is floating on top of the groundwater table. Honeywell is still compiling the pilot study results report, therefore, ADEQ has not yet had the opportunity to review the data. While it is unusual to present information that ADEQ has not reviewed fully, Ms. Kommalan stressed the importance of providing the community the information as soon as possible.

Honeywell records have shown that they have purchased approximately 27 million gallons of fuel over the last 11 years. Jet fuel has been used at the facility for over 50 years. Ms. Kommalan showed a figure depicting the jet fuel tanks and associated piping on the Honeywell property. There have been several ways that the jet fuel has been released to the environment. This included leaking tanks, leaking piping and overfilling the tanks. There are buildings containing test cells where jet engines are tested. The jet engines are also cleaned with solvents. When jet fuel and the solvents were spilled, the mixture was drained and piped to dry wells on the property. When the mixture was released through the dry well, it would reach the groundwater and float on top of the water table. The mixture varies in thickness across the solvent/jet fuel plume; the thickest is three feet. The solvent would much rather exist in the jet fuel than in the water. Therefore, any solvents that were also released would mix in with the jet fuel. The jet fuel was first discovered in April 1999 in monitoring wells 19 and 20A. Data from the first sampling indicated the jet fuel was comprised of 25% JP-4 and 75% Jet A. Another analysis indicated the following solvents were mixed with the jet fuel: TCE, Freon 113, Freon 11, 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride. This data were collected from monitoring well ASE-20A. Discussion ensued regarding the location of monitoring well ASE-20A. ADEQ's Underground Storage Tank (UST) Section is leading the oversight for the jet fuel cleanup. However, the Superfund Section is reviewing all documents and data to ensure the proper management of the solvents contained within the jet fuel.

Honeywell Bioventing Pilot Study- Jim Hartley, CH2MHill
Mr. Hartley explained that the technology will include a combination of bioventing and SVE. Mr. Hartley will cover an overview of bioventing concepts, Honeywell's potential remedial strategy, the bioventing pilot study results, and the next steps. Approximately 60 to 70 feet above the floating product, there is a soil zone. Within that soil zone, there is fuel between the soil grains and the vapors. Bioventing brings oxygen into the soil zone. The oxygen combines with the fuel and the bacteria that are present there degrade the product. A benefit of this type of cleanup is that is occurs underground. When the fuel hydrocarbon is combined with oxygen, the result is carbon dioxide and water. Bacteria help break down the hydrocarbons in the presence of oxygen.

According to Mr. Hartley, bioventing is not a new technology. Mr. Hartley provided a brief history of the use of bioventing. The first testing of bioventing was performed in the Netherlands in 1982. In 1988, bioventing was patented by Chevron Research Technology Corporation. It was promoted by the Air Force (U.S. Air Force Bioventing Initiative) and the EPA (U.S. EPA Bioremediation Field Initiative) in the mid-1980s as cost effective and efficient technology. It was performed with successful results at hundreds of petroleum-contaminated sites.

Mr. Hartley explained that Honeywell is currently in the conceptual planning stages of the potential remedial strategy. A corrective active plan (CAP) has not yet been prepared. Honeywell is proposing a combination of bioventing and SVE with continued free product recovery from existing groundwater monitoring wells. The system will involve injecting air into the soil column and recover the air with extraction wells (to avoid dispersion). There are several benefits of the combined approach. The remediation occurs by both biodegredation and volatilization of the fuel; off-gases are treated at the surface by use of air emission controls. Soils are aerated throughout the contamination zone for optimal microbial activity. The SVE enhances volatilization of free product and contains vapors at the perimeter to prevent contaminant migration. Components of the SVE/bioventing system include: injection wells, extraction wells, off-gas treatment units, blowers for injection and extraction, and process piping, instrumentation, and air emission controls.

Mr. Hartley provided a bioventing schematic diagram. Air is injected into the soil column down to the top of the water table where the floating fuel exists. The contaminated air is then extracted with the air extraction well and piped to the air treatment system. There are also multi-port monitoring wells completed in the soil to monitor the cleanup. Mr. Hartley showed a bioventing/SVE airflow schematic. This figure depicted the injection flow and extraction flow, therefore, depicting how the system will be containing the airflow. It is essential to ensure no contaminants are dispersed.

Mr. Hartley described the goals of the pilot test. The main goal of the pilot test was to gather information needed to design the full-scale system. The pilot test was also used to measure the fuel hydrocarbon and VOC concentrations in extracted vapors to compare them against static conditions, to gain a better understanding of subsurface air flow, and to estimate how much oxygen will need to be used. Two pilot tests were conducted at different wells; each test was approximately 24 hours long. A portable blower was used to extract the vapors and carbon and potassium permanganate vessels were used to treat the vapors. Several measurements were taken throughout the pilot test. Data were collected to create a computer model that would calculate how quickly the air would move from an injection well to an extraction well. This is to determine the appropriate well spacing for air flow to be at a certain rate. If the air flows takes too long, there is not enough oxygen being delivered. The pilot test detected vacuum pressure up to 200 feet away from the system. Approximately 1% of the pressure was still measurable at that distance. This confirmed that the air does not need to be injected at high pressures. As suspected, field monitoring data indicated high hydrocarbon concentrations in the vapor stream. The pilot test results indicated that the bioventing/SVE process would remove significantly higher amounts of contaminants than the current physical removal. Liquid removal would still be used in conjunction with the bioventing/SVE treatment.

Mr. Hartley explained that the next steps include evaluating the data and to prepare a technical memorandum summarizing the results of the study, meet with ADEQ UST staff to discuss the remedial strategy, prepare a corrective action plan, design a remedial system, and implement the design.

One CAG member expressed concern that pressure generated through the soil column would migrate contaminants up through the multi-port monitoring wells. Mr. Hartley replied that those monitoring wells are capped.

One CAG member asked if in the history of using the bioventing technology, have more bacteria ever been introduced into the treatment to speed up the remediation? Mr. Hartley replied that there have been some efforts to do that. He stated bacteria are hard to distribute because moisture is a limited factor. Bacteria that have existed at the site have grown accustomed to the mineral balance of the soil and fuel mixture. What the bioventing system does is produce a different environmental condition to continue bacterial growth.

There were additional questions and discussion about the proposed bioventing pilot study among the audience and staff members.

6. *Discussion of New Site Map* - John Kivett, ADEQ Project Hydrologist
Mr. Kivett provided a copy of the new site map. Mr. Kivett explained how several parties conducted

groundwater sampling at the same time to take a snapshot of groundwater conditions. The data used for this new map were taken from the September 2002 sampling event. The map depicts a separation of the OU1 plume from the OU2 plume. Also, after a year of operation of the OU2 treatment system, there appears to already be a decrease in contaminant concentration on the northern OU2 plume boundary. Mr. Kivett noted that there were some detections upgradient of the Honeywell facility. Mr. Kivett was unsure of the source of those upgradient detections. Ms. Wesoloskie stated that ADEQ and EPA will be mailing out a site wide fact sheet in the next couple of weeks to the site community involvement area. This fact sheet will include the new site map.

7. *Call to the Public*
No questions were asked during the call to the public.

8. *Future Meeting Plans*
The next meeting date was set for June 25, 2003 from 6:00 to 8:00 p.m. Location to be determined.